

WHAT IS CLAIMED IS:

1. A polystyrene blend comprising a blend of polystyrene and a polymer selected from the group consisting of syndiotactic polypropylene, ethylene
5 propylene copolymer, styrene-butadiene-styrene copolymers, and mixtures thereof, wherein the blend is prepared by solution polymerization.
2. The polystyrene blend of Claim 1 additionally comprising performing the solution polymerization using a graft-promoting agent.
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3. The polystyrene blend of Claim 2 wherein the graft-promoting agent is maleic anhydride.
4. The polystyrene blend of Claim 1 additionally comprising performing the
15 solution polymerization using a chain transfer agent.
5. The polystyrene blend of Claim 4 wherein the chain transfer agent is dodecyl mercaptan.
- 20 6. The polystyrene blend of Claim 1 additionally comprising performing the solution polymerization using a cross linking agent.
7. The polystyrene blend of Claim 6 wherein the cross linking agent is divinyl
25 benzene.
8. The polystyrene blend of Claim 1 additionally comprising an additive.

9. The polystyrene blend of Claim 8 wherein the additive is selected from the group consisting of fillers, anti-oxidants, UV stabilizers, mineral oil, and mixtures thereof.

5 10. The polystyrene blend of Claim 1 wherein the blend is composed primarily of polystyrene and syndiotactic polypropylene, and the weight ratio of polystyrene to syndiotactic polypropylene, PS:sPP, is from about 19:1 to about 4:1.

10 11. The polystyrene blend of Claim 1 wherein the blend is composed primarily of polystyrene and ethylene polypropylene copolymer, and the weight ratio of polystyrene to ethylene polypropylene copolymer, PS:EPC, is from about 19:1 to about 4:1.

15 12. A polystyrene blend wherein the blend is a blend of polystyrene, rubber, and a polymer selected from the group consisting of syndiotactic polypropylene, ethylene propylene copolymer, styrene-butadiene-styrene copolymers, and mixtures thereof, and the blend is prepared by solution polymerization.

20 13. The polystyrene blend of Claim 12 wherein the blend is composed primarily of polystyrene and rubber and syndiotactic polypropylene, and the weight ratio of polystyrene and rubber to syndiotactic polypropylene, HIP:sPP, is from about 19:1 to about 4:1.

25 14. The polystyrene blend of Claim 12 wherein the blend is composed primarily of polystyrene and rubber and ethylene polypropylene copolymer, the

weight ratio of polystyrene and rubber to ethylene polypropylene copolymer, HIP:EP, is from about 19:1 to about 4:1.

15. The polystyrene blend of Claim 12 wherein the weight ratio of polystyrene
5 to rubber, PS:RUBBER, is from about 99:1 to about 7:1.

16. A process for preparing a polystyrene blend comprising admixing styrene
and a polymer selected from the group consisting of syndiotactic polypropylene,
ethylene propylene copolymer, and mixtures thereof to form a solution, and then
10 polymerizing the styrene monomer.

17. The process of Claim 16 wherein the process additionally comprises
using a solvent to increase the solubility of the polymer in the styrene.

15 18. The process of Claim 17 wherein the solvent is selected from the group
consisting of ethylbenzene, toluene, xylenes, and cyclohexane and mixtures
thereof.

19. The process of Claim 16 additionally comprising using free radical
20 catalyst.

20. The process of Claim 19 wherein the catalyst is a peroxide catalysts
selected from the group consisting of 1,1-di-(t-butylperoxy)cyclohexane; 1,1-di-
(t-amylperoxy)cyclohexane; 1,1-di-(t-butylperoxy)-3,3,5-trimethyl-cyclohexane;
25 OO-t-amyl-O-(2-ethylhexyl monoperoxy-carbonate; OO-t-butyl O-isopropyl
monoperoxy-carbonate; OO-t-butyl-O-(2-ethylhexyl)monoperoxy-carbonate; N-

butyl-4,4-di(t-butylperoxy)valerate; ethyl 3,3-Di-(t-butylperoxy)butyrate) and mixtures thereof.